REMARKS

The office action of 06/17/2004 has been reviewed and its contents carefully noted. Reconsideration of this case, as amended, is requested. Claims 1 through 13 remain in this case.

Objections to Claims

Regarding claim 1, the character at the end of claim 1 is now replaced with a period. Appropriate correction has been done. Applicant gratefully thanks the Examiner for pointing out the instant typological deficiency.

Regarding claims 12-13, the abbreviations for "CTA", "OPA", "TA", "VCT" has been spelled out. The spelled out portion is disclosed in the Specification of the instant patent application. No new matter is added.

Rejection(s) under 35 U.S.C. §102

Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Weber et al. (PN 6,305,353).

The instant Office Action states, in part:

> Regarding claim 1 Weber discloses **at least two** (See Figure 5) groups of toothlike projections including **a first group** (See Figure 5) having **a first distance** to the center of the wheel, and **a second group** (See Figure 5) having **a second distance** to the center of the wheel, the first distance being different (See Column 4 Lines 35-67, Column 5 Lines 1-17) from the second distance. (Emphasis added)

Weber teaches an apparatus for **sensing** engine speed and engine angular position. A tone wheel with a plurality of *reference indicators and a position indicator* is mounted to a camshaft gear. The reference and position indicators **rotate past** a Hall Effect **sensor** which generates a sensor signal suitable for use by a controller for determination of engine speed and engine angular position. Other embodiments do not include a controller. (Emphasis added)

As can be seen in Weber, for example in Fig. 5, only a single group of position indicators having a single distance to the center is taught or suggested. Applicant respectively suggests that the Examiner has failed to point out a timing gear comprising: at least **two groups** of toothlike projections including a **first group** having a **first distance** to the center of the wheel, and a **second group** having a **second distance** to the center of the wheel, the first distance *being different from* the second distance.

Claim 1, as it currently stands, recites as follows:

In a **variable cam timing** (VCT) system having a crank shaft coupled to at least one cam shaft, at least one timing gear associated with the crank shaft or a cam shaft, the timing gear comprising:

at least **two groups** of toothlike projections including a **first group** having a **first distance** to the center of the wheel, and a **second group** having a **second distance** to the center of the wheel, the first distance *being different from* the second distance.

With regard to the Office Action statement that Column 4 Lines 35-67, and Column 5 Lines 1-17 teaches "the first distance being different from the second distance", Applicant cannot find any teachings or suggestion therein teaching or suggesting the same. The relevant text is listed below for the benefit of the Examiner:

> Additionally referring to FIGS. 3-6, further details concerning the configuration of tone wheel 80 and crankshaft web 72a are provided. **Tone wheel 80 is generally formed in a circular ring shape** with **an inner radius R1** as depicted in FIG. 3. Tone wheel 80 includes a first arcuate ring segment 82 and a second arcuate ring segment 92. Each arcuate segment 82, 92 defines a corresponding number of peripheral teeth 83, 93 **angularly spaced apart** from one another to define generally **uniform gaps 84, 94** therebetween. Each of teeth 83, 93 have about the same general size and shape. Similarly, each gap 84, 94 has about the same size and orientation. As a result, each tooth of wheel 80 is **angularly spaced apart** from an adjacent tooth by separation angle A1 as represented in FIG. 3. Also, the minimum outer radius of wheel 80 corresponding to gaps 84, 94 of wheel 80 is indicated by **radius R2**, and a **maximum outer radius** of wheel 80 corresponding to teeth 83, 93 is indicated by **radius R3**. Segment 82 further defines an index gap 85 corresponding to index angle A2 as indicated in FIG. 3.

Crankshaft web 72a includes face 74a defined by perimeter 76. Face 74a defines a recess 77 configured to receive wheel 80 and a number of threaded mounting bores 78 for mounting wheel 80 thereto. Because rotational axis R is perpendicular to the view plane of FIGS. 3-5, rotational axis R is represented by pivot point P in these figures. Perpendicular axes X, Y intersect at point P and radiate therefrom. Notably, face 74a is asymmetric with respect to pivot point P, axis R, axis X, and axis Y. Web 72a also has face 74b. Face 74b is located on a side of web 72a which is opposite the side having face 74a. Face 74b is illustrated in FIGS. 2 and 5, and is likewise asymmetric.

Segment 82 defines mounting holes 86. Similarly, segment 92 defines mounting holes 96. Mounting holes 86, 96 of wheel 80 are configured to align with corresponding threaded bores 78 of crankshaft web 72a. Once aligned, screws 88, 98 are threaded through holes 86, 96 to threadingly engage bores 78 and mount wheel 80 to crankshaft web 72a as illustrated in FIG. 3. Once mounted, wheel 80 has a generally circular ring shape which follows a generally circular path about crankshaft 60. Segment 82 includes end portion 93a mounted to crankshaft web 72a, end portion 93b mounted to crankshaft web 72a, and an intermediate arcuate portion 93c positioned between end portions 93a and 93b. Portion 93c extends past perimeter 76 of counter weight 72a. The multi-piece structure of wheel 80 permits segments 82, 92 to encircle a portion of crankshaft 60 without needing to disassemble crankshaft 60 or pass a reference member over an end of the crankshaft for installation or removal. By encircling the crankshaft, a high resolution index to crankshaft position ray be more readily provided.

As can be seen, Weber teaches a tone wheel 80 that is generally formed in a circular ring shape, hence there can only be a **single** distance between any group of segments or projections. Further, in Fig. 3 of Weber, minimum **radius R2** and **maximum outer radius** of wheel 80 **radius R3** corresponding to teeth 83, 93 is equally applicable to both. In other words, for circular ring, any teeth thereon can only have a single distance to a center point on wheel 80. in addition, the fact the Weber discloses a single R2 and a single R3 both of which are equally applicable to teach 83 as well as teeth 93 clearly points out that only a single distance exists.

Therefore, it is respectfully suggested that the rejection of independent claim 1 as being anticipated by *Weber* is overcome. Dependent claims 2-7, being dependent upon and further limiting independent claim 1, should also be allowable for that reason, as well as for the additional recitations they contain. Reconsideration and withdrawal of the rejection are respectfully requested.

Furthermore, with regard to claim 5, NO phaser is taught or suggested by Weber.

With regard to claim, Weber does NOT teach the **timing gear** is engaging an engine **timing chain**, said timing gear having various toothlike projections and grooves arranged on a wheel rim of a wheel for engaging **the links** of a timing chain. In fact, Weber teaches a non-engaging sensor such as a Hall Effect sensor. Similarly, in claim 7, Weber does NOT teach the timing gear is engaging an engine timing belt.

Claims 8-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Tscheplak (EP325724A).

As an initial matter, Applicant cannot find Tscheplak (EP325724A) on file, called the Examiner regarding the same; upon phone conversation conducted with the Examiner, Jaime W. Corrigan, concluded, or stipulated the following facts:

1. That the Examiner intended U.S. PAT NO. 5,059,156, an U.S. equivalent of the Tscheplak (EP325724A), among the family of patents or publication relating to Tscheplak (EP325724A) as a reference.

2. That regarding the citation of Tscheplak (EP325724A) patent in the instant Office Action, the U.S. equivalent's drawings shall be used.

3. That the basic abstract, a copy of which is included herein as Exhibit A, should be used when responding to the instant Office Action.

Claim 8 recites as follows:

In a variable cam timing (VCT) system having a crank shaft coupled to at least one cam shaft, the variable cam timing (VCT) system comprising:

a resonator positioned upon the at least one cam shaft, the resonator including at least one mass and at least one elastic element;

whereby torsional oscillation of the at least one cam shaft at a predetermined engine speed range is increased.

Whereas, Tscheplak (EP325724A) teaches a two part fly wheel having two springs for increasing the frequency of torsional oscillation. Under certain condition, one spring, under others both springs are used. As stated in the U.S. equivalent, the Worner patent, the invention teach things other then the variable cam timing (VCT) system as claimed. As stated in the U.S. equivalent, the two part fly wheel is used for "isolation between engine and transmission line under all service condition, without permitting relative movements of the flywheel elements with excessive amplitudes during load changes or when passing through the resonance range". Whereby torsional oscillation of the at least one cam shaft at **a predetermined engine speed range** is increased.

Also, Tscheplak (EP325724A) teaches, in effect, two resonators. In other words, when only one spring is used, an effectively first resonator exists; and when both springs are used, an second resonator occurs effectively. Whereas, on the other hand, the present invention claims a resonator positioned upon the at least one cam shaft. The indefinite article "a" necessarily denotes a single resonator, NOT two resonators.

Furthermore, Tscheplak (EP325724A) teaches a device such that as *engine speed* **increases**, the *engine torque* also **increases** so that the axial play of **the second group** *of springs* is taken up and the springs become effective so that the **frequency** of torsional oscillation is **increased**. This limited means for using a second group of springs in increasing the frequency of an engine torque as disclosed in the prior sentence is NOT claimed by the instant claim.

Therefore, the rejection of claim 8 is deemed overcome. Reconsideration and withdraw of the rejection is respectfully requested.

With regard to dependent claims 9-13, by virtue of there dependency, are deemed patentable as well. Furthermore, with regard to claim 10, the Office Action states:

> Regarding claim 10 Tscheplak discloses the at least one elastic (See Figure 1 (25)) element comprising annular rubber (See **Figure 1 (33)**) member attached onto the at least one cam shaft (See Figure 1 **(4)).**

However, Applicant respectfully point out to the Examiner that no indication that numeral (33), a flange ring is made out of rubber. Similarly, in Figure 1, numeral (4) denotes a hub, not a camshaft. The prior sentence also applies in regard to claim 11.

With regard to claim 12, no where in the Examiner's citation are CTA, OPA, or TA VCT systems even mentioned, let along taught or suggested.

Reconsideration and withdrawal of the rejection are respectfully requested.

Conclusion

Applicant believes the claims, as amended, are patentable over the prior art, and that this case is now in condition for allowance of all claims therein. Such action is thus respectfully requested. If the Examiner disagrees, or believes for any other reason that direct contact with Applicants' attorney would advance the prosecution of the case to finality, he is invited to telephone the undersigned at the number given below.

"Recognizing that Internet communications are not secured, I hereby authorize the PTO to communicate with me concerning any subject matter of this application by electronic mail. I understand that a copy of these communications will be made of record in the application file."

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Exhibit A

ES 2036249T3 US 5059156A 1990	Based on N/A	EP 325724 1990US-0584492	N/A September 14,

INT-CL (IPC): F16D003/14, F16D013/60 , F16F015/12

ABSTRACTED-PUB-NO: EP 325724A

BASIC-ABSTRACT:

The flywheel is made in two parts (1,2) connected to each other by a coupling which permits a limited relative angular movement between the two parts. The engine torque is transmitted from one part to the other by two groups of springs (25,26). The springs (26) in one group have an end clearance so that at low torque only the springs in the other group (25) transmit the torque.

When only these springs (25) are effective, the frequency of torsional oscillation of the flywheel is low corresponding to the low engine speed. As the engine speed increases, [redacted] is increased, USE/ADVANTAGE - For i.c. engines with improved separation of engine and transmission without load change.

ABSTRACTED-PUB-NO: EP 325724B

EQUIVALENT-ABSTRACTS:

Divided flywheel for damping rotary vibrations in engines with internal combustion having two flywheel elements (1, 2) arranged coaxially with each other, between which the flywheel weights are substantially distributed, also having a spring arrangement connected between the flywheel elements (1, 2) which has at least two groups of springs (25, 26) connected in parallel, one of which has play, and having a frictional coupling (28-32) operative between the two flywheel elements (1, 2), characterized in that the frictional coupling (28 to 32) has play, its friction elements or friction lamellae (28, 29) being connected with play in the circumferential direction to at least one flywheel element (2), and that the spring constants of the groups of springs (25, 26) are dimensioned so that the frequencies of the vibrations which can be generated at the starting speed ans no load speed of the engine lie above a low first critical frequency determined by the group of springs (25) without play and the frequencies of the vibrations which can be generated at service speeds